U.S. Department of Transportation

**Intelligent Transportation Systems
Standards Fact Sheet**

January 2000

**IEEE Std 1489 - 1999
Standard for Data Dictionaries for Intelligent
Transportation Systems**

IEEE

Overview

This standard provides the rules for developing and defining data concepts used in the intelligent transportation system (ITS) functional area data dictionaries. These data dictionaries allow unambiguous data transfer between and among the various ITS functional areas (e.g., traffic management, traveler information, and transit management). They also enable the reuse of data concepts developed by a single functional area by all other ITS functional areas.

Human communication relies on a vocabulary of words, each defined with a fixed meaning and spelling and each understood by the members of the conversation group. Computers have a similar vocabulary, called "data elements" in the data dictionary standard. Data elements, a part of the more generic "data concept," are formal definitions and representations of a single unit of information (e.g., a fact) with a unique value at any point in time about something of interest (e.g., a person, event, or place). Data concepts define all possible commands, responses, and information that may be exchanged between microprocessor-controlled electronic equipment, a central computer, and, by extension, their human operators. The data concepts are grouped and defined in functional area (generic ITS functions such as transit management) and application (specific local software application of a function) data dictionaries.

> To obtain a copy of this standard, please contact:
>
> **Institute of Electrical and Electronics Engineers (IEEE)**
> 445 Hoes Lane, P.O. Box 1331
> Piscataway, NJ 08855
> Tel: (732) 981-0060 or
>   (800) 678-IEEE
> Fax: (732) 981-9667
> Web site: www.ieee.org
> E-mail: customer.service@ieee.org
>
> Publication Date: December 1999

There are three types of data dictionaries defined in this standard: application-specific data dictionaries; functional area data dictionaries; and the ITS data registry. The data registry is a single repository for all ITS data concepts developed by the other data dictionaries with the purpose of encouraging unambiguous data interchange and reuse among the ITS functional subsystems via their specific application systems.

What is this standard for?

Historically, there have been no standards used to define the information exchanged between electronic systems. When microprocessor-controlled equipment and systems are integrated into a central control system, the commands, responses, and data may be different for each item and may be subsystem-specific. The lack of standardization made it difficult for developers to combine different systems into a larger system resulting in higher costs, as unique translators had to be developed to define the data being exchanged by the systems. However, because this standard, **IEEE Std 1489 – 1999, Standard for Data Dictionaries for Intelligent Transportation Systems**, establishes a national standard for defining data concepts, it allows transportation systems to interoperate. This standard embraces features of existing worldwide and U.S. national interconnectivity standards on how information is defined in open systems.

Who uses it?

This standard is intended for use by systems, communications, and software analysts and engineers as both developers and users of ITS data dictionaries.

How is it used?

This standard specifies a common set of data concepts and meta-attributes for ITS data dictionaries, as well as associated conventions and schemes, which enable the description, standardization, and management of all ITS data. Through consistent use of these common structures and associated conventions and schemes, data and information can be unambiguously

For more information on ITS standards, contact the Federal Highway Administration, ITS Joint Program Office, Room 3401, HOIT, 400 7th Street, SW, Washington, DC 20590, phone: 202-366-2180, fax: 202-366-3302, Web site: www.its.dot.gov/standard/standard.htm

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defined. Other ITS standards define such issues as how data elements are combined into messages, how messages are exchanged over specific communications interfaces, what groups of data should coexist within a given system, and the requirements for an ITS data registry. Through the implementation of this family of standards, data can be unambiguously interchanged and reused among the various ITS functional subsystems via their specific application systems.

Scope

This standard addresses the concept of data dictionaries as it applies to ITS and provides the underlying framework to support the concepts, as well as the set of data concepts and meta-attributes used to describe, standardize, and manage the contents of such data dictionaries. Various annexes also provide specifications for ITS naming requirements, standard ITS value domains and representation class terms, and a classification scheme for organizing ITS data dictionary contents.

Related documents

This standard was written to explain and demonstrate the process of developing, populating, using, and managing an ITS data dictionary. It requires the use of the following standard:

ISO/IEC 8824:1998—Abstract Syntax Notation One (ASN.1).

Additionally, the following standards are helpful in understanding the concepts developed and applied:

ANSI X3.30, Information Technology—Representation of Date for Information Interchange.
ANSI X3.31, Codestart—Structure for the Identification of the Counties and County Equivalents of the United States and Its Outlying and Associated Areas for Information Interchange.
ANSI X3.38, Codes—Identification of the States, the District of Columbia, and the Outlying and Associated Areas of the United States for Information Interchange.
ANSI X3.47, Codes—Structure and Data Requirements for the Identification of Named Populated Places, Primary County Divisions, and Other Locational Entities of the United States and Its Outlying and Associated Areas for Information Interchange.
ANSI NCITS.310, Information Technology—Representation of Time for Information Interchange.
ICD-GPS-200, Interface Control Document— NAVSTAR GPS Space Segment/Navigation User Interface, Rev B.
IEEE/ASTM SI 10-1997, Standard for Use of the International System of Units (SI)—The Modern Metric System.
IEEE Std 1488 - 2000—Trial Use Standard for Message Set Template for Intelligent Transportation Systems.
ISO/IEC 639—Code for the representation of names of languages.
ISO/IEC 3166-1—Codes for the representation of names of countries and their subdivisions, Part 1: Country codes.
ISO/IEC 3166-2—Codes for the representation of names of countries and their subdivisions, Part 2: Country subdivision codes.
ISO/IEC 3166-3—Codes for the representation of names of countries and their subdivisions, Part 3: Codes for formerly used names of countries.
ISO/IEC 4217—Codes for the representation of currencies and funds.
ISO/IEC 5218—Representation of the human sexes.
ISO/IEC 6709—Standard representation of latitude, longitude, and altitude for geographic points.
ISO/IEC 10646-1, Information technology—Universal multiple-octet coded character set (UCS)—Part 1: Architecture and basic multilingual plane.
ISO/IEC 11179—Specification and standardization of data elements.
SAE J1761—Information Report on ITS Terms and Definitions.
SAE J2374—Location Referencing Message Specification Information Report

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